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Original Article

Comparison of the Effectiveness of Training based on Positive Psychology and Motivational Interviewing on Emotional Distress in Patients with Type 2 Diabetes

Seyed Hamid Hosseini Tavan [1], Mahboobe Taher [2*], Shahnaz Nouhi[3], Assadollah Rajab[4]

1- Ph.D. Student of General Psychology, Department of Psychology, Shahrood Branch Azad University, Shahrood, Iran.
2- Assistant Professor,Department of Psychology, Shahrood Branch Azad University, Shahrood, Iran.
3- Assistant ProfessorDepartment of Psychology, Shahrood branch Azad University, Shahrood, Iran.
4- President of the Iranian Diabetes Association, Tehran. Iran.
*(*Corresponding Author:* Mahboobe Taher *' Mahboobe.Taher@yahoo.com)*

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Abstract

Introduction: Prevalence of diabetes has been rising in Iran that causes many social and economic problems. The aim of this study was to compare the effectiveness of training based on positive psychology and motivational interviewing on emotional distress in patients with type 2 diabetes.

Method: Quasi-experimental research design with pretest-posttest and control group were utilized in this study. The statistical population included patients with type 2 diabetes referring to the Endocrinology and Metabolism Research Institute. 48 patients were selected with convenient sampling method and divided into two experimental group and a control group. The first group received positive psychology training. The second group received a motivational interviewing and the control group did not receive any treatment. The groups were evaluated before and after the intervention using emotional distress questionnaire. Data were analyzed by using multivariate analysis of covariance.

Result: The result showed positive psychology training and motivational interview training are effective on decreasing components of psychological distress including psychological distress in relation to diabetes management and depression-related problems in patients with diabetes and positive psychological training was more effective ($p<0.05$).

Conclusion: Based on results of this study, positive psychological and motivational interviewing training have positive effect on emotional distress of type 2 diabetes patients. Both of the interventions by strengthening positive motivation and modifying the levels of negative effects reduced emotional distress scores.

Declaration of Interest: None

Keywords: Emotional distress, Positive psychology, Motivational interviewing, Type 2 of diabetes.

Introduction

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia due to defects in insulin secretion, insulin action, or both (1). That number is expected to rise to 439 million or 7.7% of all adults-by 2030 (2). In Iran, it has been estimated that 8% of the adult population have diabetes (3). The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels (2). Long-term complications of diabetes include retinopathy with the potential loss of vision; nephropathy leading to renal failure; peripheral neuropathy with risk of foot ulcers, amputations, and Charcot's joints; and autonomic neuropathy causing gastrointestinal, genitourinary, and cardiovascular symptoms and sexual dysfunction (1,2). Patients with diabetes have an increased incidence of atherosclerotic cardiovascular, and cerebrovascular disease (3, 4).

Diabetes is a challenging disease that is considered to be difficult to live with as it encompasses a lot of restricted instructions (5). Living with diabetes mellitus has been described as a dynamic personal transitional adaptation, based on restructuring of the illness perceived experience and management of the self (6).The emotional distress facing people with diabetes due to such lifestyle restriction is an area of growing clinical interest (7).Diabetes-related distress is a term that has been used in the literature to refer to the emotional and behavioral changes caused by diabetes and its demanded lifestyle alterations (8). Many studies have shown that there are many factors related to the presence or absence of diabetes distress, and its severity depends on the characteristics of the population and other psychosocial factors (9). Diabetes distress is the emotional response to living with diabetes, the burden of relentless daily self-management, and its long-term complications (10). It can also arise from the social impact of diabetes (e.g. stigma, discrimination, or dealing with other people's unhelpful reactions or their lack of understanding) and the financial implications (e.g. insurance and treatment costs) of the condition (11). If left untreated, mild diabetes distress may develop into severe diabetes distress and/or depression. Emotional problems might complicate the required self-management of the disease, and limit the persons' management of self-care activities necessary to achieve adequate glycemic control (12).A study involving patients with type 2 diabetes mellitus showed that the increased level of diabetes-specific emotional distress observed in insulin-treated patients was largely correlated with increased disease severity and self-care burden (13).

Positivist psychologists believe in following a complete understanding of human experiences from shortage, pain, disease to cure, health, well-being and human happiness instead of emphasis on pathology (14).

A meta-analysis of 26 studies found that psychological well-being was associated with lower rates of mortality in both initially healthy and medically ill populations, independent of traditional risk factors (15). Tsenkova et al (16) found that

positive affect at baseline was prospectively associated with reduced HbA1c at 2-year follow-up in older women, independent of multiple covariates. These beneficial effects of positive psychological states may be mediated through health behaviors (17). Studies have consistently found links between increased positive psychological states and greater participation in health behaviors in medical populations. For example, Hingle et al (18) found that higher levels of optimism measured at the outset of cardiac rehabilitation predicted greater improvements in physical activity and saturated fat intake. According to Seligman, positive psychology can be summarized as the scientific study of optimal human functioning that aims to discover and promote the factors that allow individuals and communities to thrive (19). These positive psychological constructs are not simply the flip-side of depression, e.g., it is possible that a depressed individual may be optimistic about the future whereas a non-depressed individual may conversely have low levels of optimism (20, 21). Prior work has found that these constructs have been linked to superior health outcomes including healthier diet, increased physical activity, and lower rates of mortality across various medical conditions (21, 22). For example, in a large epidemiologic study, measures of psychological well-being, including emotional vitality and life satisfaction, were prospectively linked with the prevention of patients with type 2 diabetes (22, 23).

Motivational interviewing is a collaborative, patient-centered counseling approach that aims to elicit behavior change (24). Counselors use empathy and other techniques to create an atmosphere to help patients to explore the discrepancies between the goals and their current behaviors (25). The focus of motivational interviewing is to find and resolve the ambivalence, improve patients' perception of the importance of behavior change, and support them to make the change (26). In a recent systematic review of motivational interviewing, it was found that there were significant improvements in many patient outcomes such as total cholesterol, fasting blood glucose, body mass index, blood pressure, waist circumference, and physical activity (27, 28). In another study, HbA1c was reduced by as much as 1% with a single brief intervention followed by a short education session, and the effects can be sustained at 3 and 6 months after motivational interviewing intervention (29). Some studies show that motivational interviewing can contribute to improving healthy eating, weight control, and increases in physical activity (30).

Therefore, this study aimed to compare positive psychology education and motivational interviewing on emotional distress in people with type 2 diabetes. Also, since no background has been found to compare these two therapeutic approaches, the researcher decided to compare and examine this issue to determine which of the two approaches plays a more effective role? Therefore, this study seeks to answer the question of whether the approach of teaching positive psychology and motivational interviewing affects emotional distress in people with type 2 diabetes.

Method

The research method was applied and semi-experimental with pre-test and post-test with a control group. The statistical

population included all patients with type 2 diabetes referred to the Endocrinology and Metabolism Research Institute of Iran University of Medical Sciences and Health Services in the second half of 1398. The sample in the study included 45 people with type 2 diabetes who were selected by the available sampling method and were randomly assigned to three groups of 15 people. Inclusion criteria were having type 2 diabetes, age of 40-65 years, duration of diabetes 5 -15 years, not having any physical and psychological complications, literacy. Exclusion criteria were the absence of more than 3 sessions and unwillingness to continue cooperation of participants. The first group received positive psychology training. (22). The second groups are people for whom motivational interview training was used (29) and the third group as a control group, no intervention was performed on them, only pre-test and post-test were taken from them. Before and after the intervention, the two groups completed the Diabetes Distress Scale. Data were analyzed in SPSS 21 software and using multivariate analysis of covariance.

Measurement

- **Diabetes Distress Scale (DDS):** The original version of the DDS was developed in English and comprises 20 items (31). Each item was originally scored on a 6-point scale, but this was later modified to a 5-point Likert scale ranging from "not a problem" (score of 0) to "serious problem" (score of 4.) The sum of the 20 items is multiplied by 1.25 to produce a final possible score of 0-100, with higher scores indicating greater diabetes-related emotional distress. The DDS comprises a three dimension (psychological distress associated with diabetes management, depression-related problems, and barriers to treatment). The overall Cronbach's alpha score for this test was 0.94 and the retest reliability was 0.84. Cronbach's alpha for the components of psychological distress associated with diabetes management, depression-related problems, and barriers to treatment were reported to be 0.84, 0.83, and 0.90, respectively (32). In a study in Iran, Cronbach's α reported 0.92. The intra class correlation ranged from 0.43 to 0.64 for test-retest. The Diabetes Distress Scale subscales were significantly correlated with the different subscales of the Depression Anxiety Stress Scale (33).

- **Interventions**

Two therapeutic approaches, positive psychology and motivational interview were the intervention methods of this study. Positive psychology training was conducted in 8 sessions of 60 minutes once a week (17) (Table1). The second experimental group underwent motivational interview training in 10 sessions of 45 minutes once a week (26) (Table2).

Table1. Positive Psychology Treatment Program (17)

Session	Content	Objective	Task
1.	Introduction	To guide clients in the context of positive psychotherapy, and the role of the psychotherapist.	Post a positive introduction of yourself on a page by clients
2.	Main concepts in positive thinking	Identify the signs and symptoms of positive thinking. Analysis of individual perspective. Fight negative thoughts	Record each person's capabilities by themselves
3.	Maintain positive behaviors	Planting positive emotions and mentioning blessings and good things in life. Rethinking Beliefs.	Mentioning blessings or remembering three good (positive) things in daily life
4.	respect yourself	Review whether writing these three good things or three blessings and emphasizing positive memories and recollection over the past week has also had a positive effect.	Repeat the homework done in the session
5.	Optimism and gratitude	Focus on Thanksgiving. Create optimism. Create a euphoria. Build confidence. Target selection	The role of good and bad memories is re-examined
6.	Control emotions	Therapists also discuss their progress with clients in writing letters of forgiveness and thanksgiving, thank-you booklets.	Clients' feedback on the treatment process and progress is also discussed.
7.	assertiveness	Basic steps for assertiveness. Focused on hope and optimism	Intermediate review of treatment
8.	Good communication with others	Create a positive environment. Maintaining health and its positivity effect. Establish good relationships with others.	Use the technique of stopping thinking, relaxation

Table2. Motivational Interview Therapy Program (26)

Session	Content	Objective	Task
1.	Sympathy	We put ourselves in the shoes of the authorities to see the world from the perspective of the authorities. Avoid stereotypes and distinguish them. Understand the sick world	Understand what is going on in the patient's head. How he interprets the world and understands the patient. Without judgment, prejudice, and labeling.
2.	Bringing the contradictions to the surface	Use questions that indicate the inconsistency of the references. On the one hand, do you like to eat everything and not exercise, and on the other hand, do you want to be respected by others? Identify the important goals of the references.	Demonstrate or raise awareness of client ambivalence.
3.	Bringing the contradictions to the level	We do not tell the authorities which one to choose and we do not tell them to choose one, we say, I am just showing you that you want two things that cannot be combined. (He wants both God and dates)	By doing this, we show the authorities that they prefer one over the other.
4.	Slip on-resistance (bypass resistance)	In dealing with resistance, do not confront in any way. Use techniques (open-ended questions, confirmation, reflective listening, and summarizing). Avoid resistance. If resistance increases, stop and change the method. Avoid exposure.	What kind of resistance do the authorities show (discussion, cutting off, denying, ignoring, denying, devaluing, procrastinating, non-participation, reasoning, blaming, interrupting the counselor, protesting, and being dissatisfied to

			be pessimistic, to be indifferent)
5.	Slip on-resistance (bypass resistance)	Change the subject. Introduce a new perspective, not impose it. Giving credit to the authorities and as a source of problem-solving methods. The therapist should not claim not to change.	Reduce resistance to change. The therapist does not confront the resistance of the clients. Do not argue with the authorities.
6.	Slip on-resistance (bypass resistance)	Are you angry that you feel that I do not know how difficult it is to control your blood sugar? You want to change and control your blood sugar, and on the other hand, it is difficult to control your blood sugar.	Ignoring these resistances with the intention that I will address and correct it later. Do not overdo it with resistance and its symptoms.
7.	Strengthen the sense of self-efficacy	Help the authorities to help themselves. Lack of authoritarian approach. (References: "Can I control my blood sugar?" Therapist: "I do not know, I can help you decide for yourself) Use techniques (open-ended questions, confirmation, reflective listening, and summarizing).	Helping clients to change within themselves. The therapist does not tell the client what to do. It does not determine the task, every move to be made comes from the authorities. The authorities are responsible for selecting and implementing individual change.
8.	Strengthen the sense of self-efficacy	Use open-ended questions about clients' sense of empowerment. (What do you think is a good step to start with? What problems do you see and how do you overcome them? What motivates you to succeed?) Use a self-confidence ruler (1 to 10 for the question of how much Are you likely to succeed?)	The client must understand that he has the ability and can use his ability. Helping clients decide which path to take. The therapist does not decide. Strengthen the sense of self-efficacy. Where this number you say come from, and the answer does is self-efficacy.
9.	Strengthen the sense of self-efficacy	Review previous successes. What similar problems have you overcome before? The hardest work you have ever done? What abilities do you see in overcoming the problem? Where will you be supported? What are the characteristics of successful people in this field? Re-interpreting the statements of the authorities, trying instead of failing: How many times did you try? How many times have you failed to control your blood sugar?	Overcoming previous obstacles can save the future. Emphasis on the patient's sense of self-efficacy. Show the attributes of references to one-self. Traits were related to cracking in references. We teach the authorities that every effort you make has added something to his ability. Talking about the positives leads to an increased sense of self-efficacy.
10.	Strengthen the commitment to change	Direct guidance and advice to clients (what are your goals, what is the plan and plan for change, what is the commitment to change, and what is the plan and plan?)	We have to do something to keep the person changing. Commit to change continuously, and do not give up, do not back down.

Results

This study aimed to compare the effectiveness of positivist psychology training and motivational interviewing on emotional distress in people with type 2 diabetes. Descriptive and inferential information about each of the variables and therapies is provided below (Table 3).As seen in Table 3, there is an obvious difference between the mean posttest scores of Emotional distress components in the control and experimental groups.

Table 3: Descriptive indices of the variables of emotional distress in experimental and control groups (n = 45)

Group	Time	Psychological distress M(SD)	depression-related problems M(SD)	Barriers to treatment M(SD)
Positive Psychology	Pretest	6.93(1.38)	13. 20(2.36)	14.73(2.01)
	Posttest	16.06(2.05)	23.60(2.53)	23.60(2.52)
Motivational Interview	Pretest	17.13(1.69)	13.26(2.08)	14.66(2.02)
	Posttest	13.93(2.25)	9.66(3.13)	21.61(2.55)
Control	Pretest	6.40(1.88)	12.60(2.22)	14.41(2.64)
	Posttest	7.13(2.16)	13.06(2.34)	14.57(2.89)

In order to observe the assumptions of parametric tests, Box and Levene's tests were used before using the parametric test of multivariate analysis of covariance. The results of the Box test were not significant for any of the variables; based on this test, the presumption of homogeneity of variance/covariance matrixes have been well observed (Box=45.12, F=2.27, P=0.11). According to the results of Levene's test, the presumption of equality of intergroup variances has been observed for posttest and its insignificant results for components of psychological distress associated with diabetes management, depression-related problems, and barriers to treatment (P>0.05). So, multivariate analysis of covariance can be done. The results of Wilks Lambda showed that there is a significant difference between the posttest of the studied groups in terms of at least one of the dependent variables (Wilks Lambda= 0.28, F=31.09, P < 0.001). According to the results of eta-squared, it was found that the difference between the two groups is significant regarding the dependent variables and this difference in posttest is 62% based on Wilks Lambda (eta squared=0.620); i.e. 62% of the variance is related to the difference between the two groups which results from the mutual effect of dependent variable of components of psychological distress.

Table4. The results of the analysis of covariance

Variable	Source change	SS	SS	MS	MS	F	P	Eta
Psychological distress	**Pretest**	4.31	88.26	2.15	2.10	1.02	0.36	0.04
	Posttest	652.98	195.60	326.48	4.65	70.11	0.001	0.76
Depression-related problems	**Pretest**	40.44	208.93	2.02	4.97	0.41	0.66	0.01
	Posttest	849.91	311.86	424.95	7.42	57.23	0.001	0.73
Barriers to treatment	**Pretest**	0.93	211.86	0.46	5.04	0.09	0.91	0.00
	Posttest	641.64	263.33	51.16	6.27	51.16	0.001	0.71

As presented in table 4, with the controlled effect of pretest, there is a significant difference between the posttest results of experimental and control groups in terms of the mean scores of psychological distresses associated with diabetes management (F=70.11), depression-related problems (F=72.23), and barriers to treatment (F=51.83) (P< 0.01). In other words, positive psychology training and motivational interview training have significantly decreased components of psychological distress in patients with diabetes. The difference between the adjusting means in the components of psychological distress associated with diabetes management 2.13 (P=.02), depression-related problems 3.93 (P=001), and barriers to treatment 1.93 (P=.12) shows that positive psychology is more effective in the components of psychological distress associated with diabetes management and depression-related problems than motivational interviewing.

Discussion

The aim of this study was to compare the effectiveness of positive psychology training and motivational interviewing on emotional distress in people with type 2 diabetes. The results showed that positive psychology treatments affect the components of emotional distress. This result is consistent with the results of previous studies (16-18).

In the theoretical explanation of these findings, it can be said that positive psychology training can help to improve emotional distress in people with type 2 diabetes by enhancing the positive relationship with oneself, others, and life and increase self-esteem. The training of optimism and positive thinking skills encourages people with type 2 diabetes to notice positive and good experiences and their role in increasing respect for themselves and others rather than reminding negative thoughts about their illnesses and their constraints (18). Generally, positive psychosocial training by creating positive thinking leads to a happy life, a better way of looking at life rather than focusing on illness and its symptoms and limitations (16) this process in turn can reduce emotional distress. Positive psychosocial interventions may be able to modify positive psychological well-being, even in patients with medical illness. Attention to positive emotions, positive sources of energy, positive energy transfer to others, the reduction of psychological stress and self-confidence may have contributed to the improvement of positive emotion in patients with type 2 diabetes. Positive experiences and cognitions can help people better attend to and process health information including unbiased and open appraisal of negative health information. Because positive emotions include a component of positive affect, they too function as internal signals to approach or continue. Even so, positive emotions share this function with a range of other positive affective states. Sensory pleasure, for instance, motivates people to approach and continue consuming whatever stimulus is biologically useful for them at the moment (16). Likewise, free-floating positive moods motivate people to continue along any line of thinking or action that they have initiated (22). As such, functional accounts of positive emotions that emphasize tendencies to approach or continue may only capture the lowest common

denominator across all affective states that share a pleasant subjective feel, leaving additional functions unique to specific positive emotions uncharted (21).

Positive psychology training interventions have several potential advantages to other treatment programs, particularly when considering individuals with type 2 diabetes. First, as opposed to treatments that are applied only to patients with clinical depression or other psychiatric disorders, positivist psychology interventions are instead designed to increase positive psychological well-being across a variety of different populations, including those considered to be psychiatrically healthy (32). This should make the positivist psychology intervention more applicable to individuals with type 2 diabetes who may experience a range of psychiatric symptoms. Positivist psychology also differs from somewhat-related mindfulness-based stress reduction and self-efficacy interventions (35) in that it: (a) specifically targets constructs positive affect and optimism-linked to superior adherence and outcomes in individuals with type 2 diabetes, (b) utilizes validated positivist psychology exercises found to be effective across dozens of studies, and (c) is simple for patients and does not require the substantial provider training needed for most other interventions.

The results also showed that motivational interviews affect the components of emotional distress. This result is consistent with the results of previous studies (35-37). Motivational interview has become popular among different medical populations and disciplines as a pioneer and effective method in the field of healthcare for making behavioral change in patients. Motivational interviewing has succeeded in empowering therapeutic involvement, improving emotional health, and increasing motivation and self-confidence for change. In addition, motivational interview has been considered effective as much as and sometimes more than the other common therapeutic methods in a wide range of behavioral goals (35). Motivational interviews experts listen carefully for the language of change within an atmosphere of acceptance and compassion, reinforcing client autonomy and choice. As the change talk strengthens, these actions help the clients to prepare a practical plan (36). An important element of motivational interviews lies in this concept that patients are naturally aware of their needs and think about how to fulfill them (36). This contradicts the classic standpoint that considers physicians as "providers", capable of providing whatever the patients do not own. These include skills such as insight and problem solving ability. The value of this style can nowadays be seen in primary healthcare, in which the service providers are faced with several problems of chronic physical diseases that are intensified by mental and behavioral disorders (37). The motivational interviewer relies more on the clients' views than those of specialists. Therapists avoid persuading the clients towards specific solutions that may create discord in the relationship. According, the positive psychosocial interventions, motivational interviewer sessions can be considered along with other medical treatments to not only improve therapeutic effectiveness but also decrease frequent checkups of those who lack therapeutic and pharmacological compliance. This prevents additional costs to the patient with diabetes and society.

Conflict of interest statement

The authors declare no conflict of interest.

References

1- Sneha N, Gangil T. Analysis of diabetes mellitus for early prediction using optimal features selection. J. Big Data. 2019; 6(1):13-26.

2- Glovaci D, Fan W, Wong ND. Epidemiology of diabetes mellitus and cardiovascular disease. Curr. Cardiol. Rep. 2019; 21(4):21.

3- Mashhadi HB. The role of Mediator's Spirituality in Relationship between Resilience and the Quality of life in Patients with type II diabete. IJABS. 2019; 5(3):34-9.

4- Oguntibeju OO. Type 2 diabetes mellitus, oxidative stress and inflammation: examining the links. j. physiol. 2019; 11(3):45.

5- Perrin N, Bodicoat DH, Davies MJ, Robertson N, Snoek FJ, Khunti K. Effectiveness of psychoeducational interventions for the treatment of diabetes-specific emotional distress and glycaemic control in people with type 2 diabetes: a systematic review and meta-analysis. Prim. Care Diabetes. 2019; 13(6):556-67.

6- Niaei, A., Hasani, J., Moradi, A., & Ebadi, S.A. Ecological Model of Adaptation with Diabetes type 2: Development and Study of Empiric Fitness.IJABS.2020; 6 (2): 35-51.

7- Iturralde E, Rausch JR, Weissberg-Benchell J, Hood KK. Diabetes-related emotional distress over time. Pediatrics. 2019; 143(6):405-412.

8- Schinckus L, Dangoisse F, Van den Broucke S, Mikolajczak M. When knowing is not enough: Emotional distress and depression reduce the positive effects of health literacy on diabetes self-management. Patient Educ. Couns. 2018 Feb 1; 101(2):324-30.

9- Weissberg-Benchell J, Vesco AT, Rychlik K. Diabetes camp still matters: Relationships with diabetes-specific distress, strengths, and self-care skills. Pediatr. Diabetes. 2019; 20(3):353-60.

10- Halepian L, Saleh MB, Hallit S, Khabbaz LR. Adherence to insulin, emotional distress, and trust in physician among patients with diabetes: a cross-sectional study. DIABETES THER. 2018; 9(2):713-26.

11- Gonzalez JS, Kane NS, Binko DH, Shapira A, Hoogendoorn CJ. Tangled up in blue: unraveling the links between emotional distress and treatment adherence in type 2 diabetes. Diabetes Care. 2016; 39(12):2182-9.

12- Bai JW, Lovblom LE, Cardinez M, Weisman A, Farooqi MA, Halpern EM, Boulet G, Eldelekli D, Lovshin JA, Lytvyn Y, Keenan HA. Neuropathy and presence of emotional distress and depression in longstanding diabetes: results from the Canadian study of longevity in type 1 diabetes. J Diabetes Complicat. 2017; 31(8):1318-24.

13- Schinckus L, Dangoisse F, Van den Broucke S, Mikolajczak M. When knowing is not enough: Emotional distress and depression reduce the positive effects of health literacy on diabetes self-management. Patient Educ. Couns. 2018; 101(2):324-30.

14- Tabatabaee, S.M., Albooyeh, G., Safari, H., & Rajabppor, M. The effect of positive psychology intervention on psychological well-being of drugs inmates. IJABS. 2016; 2 (3): 8-14.

15- Winkley K, Upsher R, Stahl D, Pollard D, Kasera A, Brennan A, Heller S, Ismail K. Psychological interventions to improve self-management of type 1 and type 2 diabetes: a systematic review. Health Technol. Assess. (Winchester, England). 2020; 24(28):1-10.

16- Tsenkova VK, Karlamangla AS, Ryff CD. Parental history of diabetes, positive affect, and diabetes risk in adults: Findings from MIDUS. Ann Behav Med. 2016; 50(6):836-43.

17- Seligman ME, Rashid T, Parks AC. Positive psychotherapy. Am Psychol. 2006; 61(8):774-782.

18- Hingle MD, Wertheim BC, Tindle HA, Tinker L, Seguin RA, Rosal MC, Thomson CA. Optimism and diet quality in the Women's Health Initiative. J Acad Nutr Diet. 2014; 114(7):1036-45.

19- Seligman ME, Csikszentmihalyi M. Positive psychology: An introduction. InFlow and the foundations of positive

psychology 2014 (pp. 279-298). Springer Sci. Rev.
20- Donaldson SI, Dollwet M, Rao MA. Happiness, excellence, and optimal human functioning revisited: Examining the peer-reviewed literature linked to positive psychology. J Posit Psychol. 2015; 10(3):185-95.
21- Jaser SS, Datye K, Morrow T, Sinisterra M, LeStourgeon L, Abadula F, Bell GE, Streisand R. THR1VE! Positive psychology intervention to treat diabetes distress in teens with type 1 diabetes: Rationale and trial design. Contemp. Clin. Trials Commun. 2020:22(10):188-198.
22- Huffman JC, DuBois CM, Millstein RA, Celano CM, Wexler D. Positive psychological interventions for patients with type 2 diabetes: rationale, theoretical model, and intervention development. J. Diabetes Res. 2015; 17(8):69-78.
23- DuBois CM, Millstein RA, Celano CM, Wexler DJ, Huffman JC. Feasibility and acceptability of a positive psychological intervention for patients with type 2 diabetes. Prim Care Companion CNS Disord. 2016; 18(3):89-97.
24- Celano CM, Gianangelo TA, Millstein RA, Chung WJ, Wexler DJ, Park ER, Huffman JC. A positive psychology–motivational interviewing intervention for patients with type 2 diabetes: proof-of-concept trial. Int J psychiat med. 2019; 54(2):97-114.
25- Jones A, Vallis M, Pouwer F. If it does not significantly change HbA1c levels why should we waste time on it? A plea for the prioritization of psychological well-being in people with diabetes. Diabet. Med. 2015; 32(2):155-63.
26- Miller WR, Rollnick S. Motivational interviewing: preparing people for change. 2nd ed: New York, Guilford Press; 2002.
27- Lundahl B, Moleni T, Burke BL, Butters R, Tollefson D, Butler C, Rollnick S. Motivational interviewing in medical care settings: a systematic review and meta-analysis of randomized controlled trials. Patient Educ Couns. 2013; 93(2):157–68.
28- Thepwongsa I, Muthukumar R, Kessomboon P. Motivational interviewing by general practitioners for type 2 diabetes patients: a systematic review. Fam. Pract. 2017; 34(4):376–83.
29- Wang YC, Stewart SM, Mackenzie M, et al. A randomized controlled trial comparing motivational interviewing in education to structured diabetes education in teens with type 1 diabetes. Diabetes Care. 2010; 33:1741–1753.
30- Song D, Xu TZ, Sun QH. Effect of motivational interviewing on self-management in patients with type 2 diabetes mellitus: a meta-analysis. Int J Nurs Sci. 2017:291–7.
31- Ekong G, Kavookjian J. Motivational interviewing and outcomes in adults with type 2 diabetes: a systematic review. Patient Educ Couns. 2016; 99(6):944–52.
32- Polonsky WH, Anderson BJ, Lohrer PA, Welch G, Jacobson AM, Aponte JE, Schwartz CE: Assessment of diabetes-related distress. Diabetes Care 1995, 18: 754–760.
33- Welch G, Weinger K, Anderson B, Polonsky WH: Responsiveness of the Problem Areas in Diabetes (PAID) questionnaire. Diabet. Med. 2003, 20: 69–72.
34- Rahimi M, Jalali M, Nouri R, Rahimi M. The Mediating Role of Resilience and Diabetes Distress in Relationship between Depression and Treatment Adherence in Type 2 Diabetes among Iranian Patients. J. Community Health Res. 2020 Jun 27.
35- Höjdahl T, Magnus JH, Mdala I, Hagen R, Langeland E. Emotional distress and sense of coherence in women completing a motivational program in five countries. A prospective study. Int J of Prisoner Health. 2015; 2(2):212-220.
36- Medley AR, Powell T. Motivational interviewing to promote self-awareness and engagement in rehabilitation following acquired brain injury: A conceptual review. Neuropsychological rehabilitation. 2010 Aug 1; 20(4):481-508.
37- Holt C, Milgrom J, Gemmill AW. Improving help-seeking for postnatal depression and anxiety: a cluster randomised controlled trial of motivational interviewing. Archives of women's mental health. 2017 Dec 1; 20(6):791-801.